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RETURN RECEIPT REQUESTED

July 26, 2006

~~Mat Johansen~~ David G
Groundwater Project Manager
Los Alamos Site Office, Department of Energy
528 35th Street, Mail Stop A316
Los Alamos, NM 87544

David McInroy
Remediation Services Deputy Project Director
Los Alamos National Laboratory
P.O. Box 1663, Mail Stop M992
Los Alamos, NM 87545

RE: NOTICE OF DISAPPROVAL FOR THE "INVESTIGATION REPORT FOR MATERIAL DISPOSAL AREA G, CONSOLIDATED UNIT 54-013(b)-99, AT TECHNICAL AREA 54" LOS ALAMOS NATIONAL LABORATORY
EPA ID #NM0890010515
HWB-LANL-05-019

Dear Messrs. Johansen and McInroy:

The New Mexico Environment Department (NMED) is in receipt of the United States Department of Energy and University of California (collectively, the Permittees) document entitled *Investigation Report for Material Disposal Area G, Consolidated Unit 54-013(b)-99, at Technical Area 54* (hereafter, the Report) dated September 2005 and referenced by LA-UR-05-6398/ER2005-0626. NMED has reviewed the Report and hereby issues this notice of disapproval (NOD). The comments in this letter are restricted to the issue of definition of nature and extent of contamination and do not address other information presented in the Report. Because the extent has not been defined, the Permittees must submit a supplemental work plan to complete determination of the extent of vapor phase contamination at Material Disposal Area (MDA) G within 60 days of receipt of this letter.

Comments for Development of a Supplemental Work Plan:

Vertical Profiles of VOCs in the Eastern Portion

1. The primary objective of the 2005 investigation activities approved by NMED on November 5, 2004 is to complete the determination of the nature and extent of the contamination identified during previous investigations of MDA G. As shown by the data in Table 6.6-1 and -2, the extent of vapor phase volatile organic compounds (VOCs) in the eastern portion of MDA G has not been delineated in the vertical direction.

   In particular, much higher concentrations of VOCs were reported in samples collected from the deeper of the two sampling ports in BH-18, -19, -25 and 26, which are located around Structures 412, 226 and 48. For trichloroethane[1,1,1-] (TCA) detected in the subsurface pore gas, concentration increases were observed with increasing depth from 30-32 to 136-138 feet in BH-18 (from 464,000 to 709,000 $\mu g/m^3$), from 20-22 to 144-146 feet in BH-19 (from 32,700 to 98,200 $\mu g/m^3$), from 30-32 to 134-136 feet in BH-25 (from 65,400 to 70,900 $\mu g/m^3$), and from 36-37 to 156-158 feet in BH-26 (from 98,200 to 447,000 $\mu g/m^3$). Significant increases in concentrations with depth have also been observed at these sampling locations for other VOCs, including trichloroethene (TCE), tetrachloroethene (PCE), dichloroethane[1,1-], dichloroethene[1,1-], and trichloro-1,2,2-trifluoroethane[1,1,2-]. Among these chemicals, TCE and PCE at the currently reported levels already pose a potential risk of contaminating groundwater (see Comment 2 for a detailed analysis). The vertical extent of VOC contamination in the eastern portion of MDA G must therefore be further characterized to complement the 2005 investigation activities.

TCE and PCE Contamination in Subsurface Pore Gas

2. Although the discussion in the Report focused on analysis of TCA contamination in subsurface pore gas, the vapor phase concentrations of TCE and PCE actually pose the highest risk of contaminating groundwater. Calculations utilizing the approach and method for evaluation of pore gas sampling data recently proposed by the Permittees (June 15, 2006, ER2006-0582, LA-UR-06-4107) show that TCE and PCE at concentrations as low as 120 and 3500 $\mu g/m^3$, respectively, in vapor phase could cause groundwater contamination above tap water soil screening levels of 0.277 µg/L for TCE and 4.32 µg/L for PCE as defined in the *Technical Background Document for Development of Soil Screening Levels* (NMED 2006, Revision 4.0). Further calculations using the same approach indicate that TCE and PCE concentrations in subsurface pore gas must be maintained below 2200 and 3800 $\mu g/m^3$, respectively, in contact with groundwater to conservatively prevent TCE and PCE from partitioning into groundwater that could theoretically result in concentrations above the MCL of 5 µg/L.

Plate 6.6-1 and Table 6.6-1 in the Report demonstrate that there are four TCE contamination zones in subsurface pore gas throughout MDA G from east to west, including locations at BH-34 (32,000-12,000 $\mu g/m^3$, concentrations decrease with depth), BH-10 (12,400-6,980 $\mu g/m^3$, concentrations decrease with depth), BH-2 (53,700-29,000 $\mu g/m^3$, concentrations decrease with depth), and BH-18, -19, and -26 (1,020-85,90 $\mu g/m^3$, concentrations increase with depth for all three boreholes). It is likely that the sources of TCE in the four zones are different because TCE concentrations detected in pore gas samples collected from borings located between these four zones are much lower (Plate 6.6-1). Additionally, the highest PCE concentrations in vapor phase were observed in BH-15-1 (11,500 $\mu g/m^3$, same for both depths), located in the central portion of MDA G, and BH-26 (1,020-5,490 $\mu g/m^3$, concentrations increase with depth) in the east portion of MDA G.

In conclusion, the current vapor phase data are insufficient to delineate the extent of TCE and PCE contamination in the vertical direction. In addition, all of the sources of subsurface VOC contamination have not been identified across MDA G. Data documented in the Report are insufficient to assess the potential risk of contaminating groundwater by TCE and PCE in subsurface pore gas; therefore, appropriate corrective measures cannot be evaluated.

Requirements for a Supplemental Work Plan

3. In order to be able to assess potential corrective measures for MDA G, the Permittees must conduct further investigation to delineate the vertical extent of VOCs in subsurface pore gas. The Permittees must demonstrate a trend of reasonable decreases in vapor phase VOC concentrations, especially of TCE and PCE, with depth to determine the vertical extent.

   Specifically, the Permittees must advance four more boreholes in the vicinities of BH-34, BH-10, BH-15-1 and BH-2 to allow collection of subsurface pore gas samples for VOC analysis. In the eastern portion of MDA G, at least two more boreholes must be drilled in the vicinities of BH-18/BH-19 and BH-25/BH-26 also to collect pore gas samples for VOC analysis. After initial sample collection, the borings must be converted to vapor monitoring wells with sampling ports located at depth intervals deeper than the total depths reached by the previous boreholes. The sampling locations must be approved by NMED prior to installation.

   The total depth for each new borehole must be determined based on on-site field monitoring data of vapor phase TCE and PCE concentrations using either the field measurement method described in Appendix B of the Report or using a portable gas chromatograph (GC). A field measurement of vapor phase TCE and PCE concentrations below half of the calculated lower partitioning limits of 2200 and 3800 $\mu g/m^3$, respectively, can be used as an indicator that the total depth has been

reached for each borehole. Alternatively, the Permittees may propose a different method to define the total drilling depths and locations for installation of the deepest VOC sampling ports. The proposed method is subject to approval by NMED.

Comments for Revision of the Report:

4. The revised Report must include all data that will be collected from the supplemental investigation activities defined in the supplemental work plan. In light of the apparent four TCE and two PCE contamination zones at MDA G (Plate 6.6-1), the Permittees must analyze the trends of VOC concentrations in vapor phase throughout MDA G and discuss pits, shafts or trenches that are likely sources of contamination in the revised Report.

   It is likely that TCE and PCE are two contaminants identified in subsurface pore gas that will be targeted by future corrective measures. The Permittees must therefore evaluate the vertical trend of TCE and PCE concentrations in subsurface pore gas, and project downward migration rate and extent in the subsurface in case the supplemental boreholes could not reach the depths where TCE and PCE concentrations in vapor phase are below half of the calculated lower partitioning limits of 2200 and 3800 $\mu g/m^3$, respectively.

5. In Table 6.5-1, the ambient oxygen concentrations were reported in the range from 16.7% to 18.0%, which is below the minimum oxygen concentration of 19.5% in ambient air for worker safety. The Permittees must discuss Quality Assurance and Quality Control data to ensure appropriate calibration of field instruments.

6. Appendix G - Inhalation of atmospheric contaminants, such as tritium and VOCs, has been identified as a potential pathway of exposure. However, the Report did not incorporate VOC concentrations detected in ambient air at MDA G into the risk assessment. According to the *RFI Report for Material Disposal Areas G, H, and L at Technical Area 54* (2000, LA-UR-00-1140/ER19990003), benzene, toluene, TCA and other hazardous constituents have been detected in ambient air at MDA G at concentrations significantly higher than that observed at background air monitoring stations. The Permittees must provide rationale for exclusion of inhalation of atmospheric contaminants from the risk assessment in the revised Report.

   The risk assessment must also be revised to incorporate the data that will be obtained from the supplemental investigation activities.

7. Appendix I - The proposed *Long-Term Subsurface Vapor Monitoring Plan* in Appendix I must be removed from the Report. Sufficient information, particularly the vertical extent and source of contamination, does not yet exist to provide a basis for development of a long-term subsurface vapor monitoring plan. NMED will require submittal of such a plan as part of the corrective measures evaluation.

The Permittees must develop a supplemental work plan to include all of the investigation activities mentioned in Comments 1, 2 and 3 and descriptions of all methods and procedures for the proposed work. The supplemental plan must be submitted to NMED for approval within 60 days after receipt of this NOD. The Permittees must submit a revised investigation report that includes resolution of the comments herein within 90 days after completion of the supplemental investigation activities. The revised Report must include all results obtained from these supplemental investigation activities. As part of the response letter that will accompany the revised Report, the Permittees must also include a table that details where all revisions have been made to the Report that cross-references NMED's numbered comments. All submittals must be in the form of two paper copies and one electronic copy in accordance with section XI.A of the Consent Order. An electronic redline-strikeout version of the Revised Investigation Report must also be submitted. Should you have any questions or comments, please contact David Cobrain at (505) 428-2553 or Hai Shen at (505) 428-2539.

Sincerely,

for

James P. Bearzi
Chief
Hazardous Waste Bureau

JPB:hs

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file: Reading and LANL TA-54 (MDA G, SWMU 54-013(b), IRMDAG)